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CASE REPORT

Displaced end cap from distal femoral nail (DFN) causing a locked knee

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Introduction

The distal femoral nail (DFN) is indicated for the stabilisation of fractures of the distal femur. It can also be used for diaphyseal fractures in which a retrograde approach is indicated; e.g. obese patients; for ipsilateral fractures of the femur and patella and/or tibia; or where there is a proximal or distal endoprosthesis.

Once the nail is inserted, proximal and distal locking screws are used. For non-osteoporotic bone and simple supracondylar fracture morphology two standard distal locking screws are used. In complex supracondylar fractures or osteoporotic bone, the spiral blade locking option is used providing better load distribution and improving fixation of the distal fragment. In order to block the distal locking screw for a more stable angle and to prevent bone ingrowth into the nail the use of an end cap is essential.[2] During placement of the end cap, it is important to avoid any cross-threading, and to tighten the end cap firmly.[2]

We report the case of a patient with a distal femoral fracture treated with a DFN who subsequently developed an acutely locked knee due to disengagement of DFN end cap.

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Case report

A 51-year-old man sustained a right side distal third spiral femoral fracture following a mechanical fall; this was stabilised with a DFN (Figs. 1 and 2). Following discharge he was reviewed in fracture clinic at 2 weeks and again at 5 weeks where he was found to be making satisfactory progress.

Ten weeks following the initial injury he was once again reviewed in fracture clinic. Examination in clinic revealed the patient to be in some discomfort with the right knee locked in 30 degrees of flexion. There had been no history of trauma between discharge from hospital and this presentation. Radiographs demonstrated the end-cap of the distal femoral nail in the knee joint (Figs. 3 and 4); otherwise the fracture was healing nicely.

The patient was admitted and taken to the operating theatre for arthroscopy of the right knee. This confirmed the presence of the DFN end-cap in the inter-condylar notch (Fig. 5), which was then removed with ease (Fig. 6). He was discharged that day.

At review 8 weeks later there were no issues in relation to removal of the end cap though he had some local tenderness over the distal locking screws. He was subsequently discharged from care after having the screws removed.

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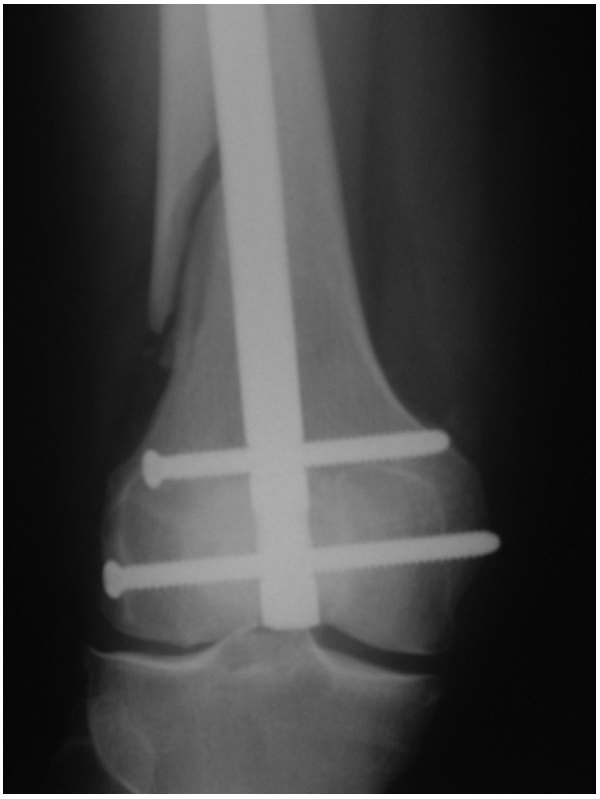

Figure 1 AP view distal femur.

Figure 2 Lateral view distal femur.

Figure 3 AP view distal femur showing disengaged end cap.

Discussion

To our knowledge this is not only a previously unreported cause for an acutely locked knee, but also an unreported complication of the DFN. Complications thus far reported include: breakage of the distal locking screw,[4] loss of reduction,[3,4] non-union,[4] infection,[3,4] deep femoral arterial injury,[1,4,5] loosening of the spiral blade or locking screw,[3] implant failure.[3]

Figure 4 Lateral view distal femur showing disengaged end cap.

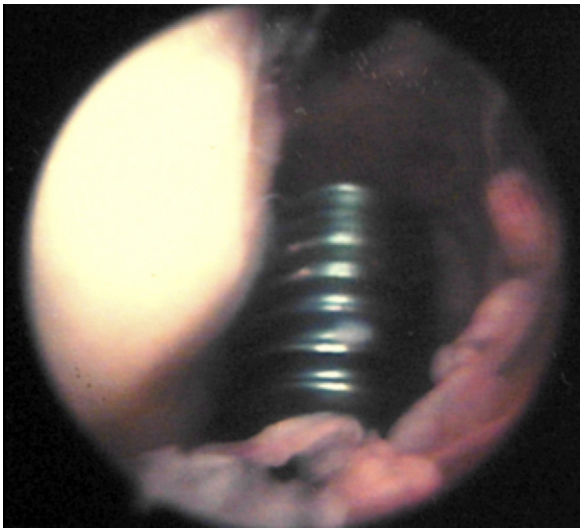

Figure 5 Arthroscopic view of end cap.

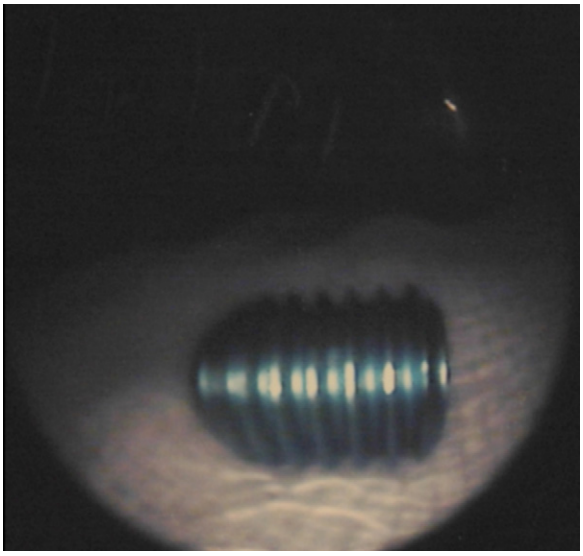

Figure 6 End cap after removal.

There is the potential for damage to the articular surface of the knee joint, and as such loosening of the DFN end cap is a potentially serious complication. There are several possible explanations for this to have occurred; perhaps the most plausible are cross-threading or failure to have adequately tightened the screw during the initial procedure. Further reporting of such incidents may provide a more definitive answer, though we would recommend extra vigilance during tightening of the DFN end cap.

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